

Work Order ID 68975

Tuesday, April 26, 2011 2:30:41 PM



Page 1

Item ID: D204-635-041

Accept



Setup Start



Revision ID:

Item Name: Replacement Skidtube

Stop



Start Date: 4/27/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 5/10/2011 Req'd Qty: 1.00



Customer:

Ship May 11th or sooner

Reference:

Approvals:

Process Plan: *UMF*

Date: *4-26*

Tooling:

Date:

Run

Start



QC:

Date:

SPC (Y/N):

Date:

Stop



Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

Draw Nbr	Revision Nbr
D2590	RevD DEO-D1

100

0.00



DC

0.00

Document Control

Memo

Photocopy bluefile & type labels per PPP D204-635-041
CHG 004

NAD

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
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Page 2

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Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

110

0.00



Skidtubes

0.00

Skidtubes

Memo

1- Inspect mat'l D2500-1-190 for damage

2-Cut D2500-1-190 per Dwg D2590 .Debur ends

3-Drill pilot holes using drill jig DT 8149 & DT8711-1&-2 and open to finish size as per dwg

4-Debur holes as per QSI002 section 4.2.3 and blow out all chips from inside of tube

5-Acid etch and Alodine tube per QSI 005 4.1

6-Bond web in place per QSI 015. Allow 12 Hrs. cure time before cutting

Pick:

Qty ☐ Part Number ☐ Description ☐ BatchA/R ☐ ☐ Sikaflex-291 ☐ 3116948 ☐

Sikaflex expire date: 12/01/15

Start Time: 4:00

Fin Time: 4:15

B 11/05/08

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Page 3

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Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

120

0.00



CNC Bend 1

Memo

0.00

CNC Delta 100 Bender

Bend as per program D2590.C on CNC Bender

1 0 BE 11/05/10

130

0.00



Skidtubes

Memo

0.00

Skidtubes

1-Cut tubes as per Dwg. D2590.

2-Debur ends after cutting.

BB 11/05/11

140

QC6- Inspect dimensions to drawing

0.00



QC

Memo

0.00

Quality Control

DD 11-5-11

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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Page 4

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Cust Item ID:

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Customer:

Reference:

Run Start



Approvals:

Process Plan:

Date:

Tooling:

Date:

Stop



QC:

Date:

SPC (Y/N):

Date:

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

150

0.00



Skidtubes

Skidtubes

Memo

0.00

1-Prepare tube for welding D2576-3 Step Remove alodine as required.

BE 11/05/11

2-Weld step D2576 as per Dwg. D2590 and QSI 004

A/R Aluminum Rod

M116577

BE 11/05/11

3-Grind weld flush on step

BB 11/05/11

4-Insert D4202-1 spacer, swage as per QSI002 and trim/ grind flush per QSI002 and as per dwg

WELDED BE 11/05/11
A/R M116577

5-Drill holes for wearplates using DT 8218 & DT8937 Open holes to 19/64", adjust stopper not to hit web. Deburr

6-Drill pilot holes for aft cap using DT 8215 Open holes to #6 Drill bit. Deburr

BB 11/05/11

7-Drill pilot holes for Tow ring using DT9425 open to .640" and Deburr
****verified dim. before drilling****

BE 11/05/11

160

QC10- Inspect visual per QSI004- ground welds

0.00



QC

Quality Control

Memo

0.00

8 11/05/12

AD

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Page 5

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Customer:

Reference:

Run Start



Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Stop



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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170

QC6- Inspect dimensions to drawing

0.00



QC

Memo

0.00

Quality Control

8/11/12

FD

175

Pressure Wash per QSI005 4.3

0.00



HandFinish

Memo

0.00

Hand Finishing

Re-alodine tube as per QSI 005 section 4.1.2.1 do not acid etch.

(IX) M/L 11/05/12

180

White Gloss(Ref:4.3.5.1) per QSI005 4.3-Alum

0.00



Powdercoat

Memo

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

*11:45
320°F
12:15*

IX M/L 11/05/12

Powder Coating

N116964

W/O:		WORK ORDER CHANGES					
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Tuesday, April 26, 2011 2:30:41 PM



Page 6

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Customer:

Reference:

Approvals:

Process Plan: _____

Date: _____

Tooling: _____

Date: _____

Run Start



QC: _____

Date: _____

SPC (Y/N): _____

Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

190

QC3- Inspect Part Finish

0.00



QC

Memo

0.00

Quality Control

1 0 11/05/12

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Tuesday, April 26, 2011 2:30:41 PM



Page 7

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Cust Item ID:

Required Date: 5/10/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop

Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

200

0.00



HandFinish

Memo

0.00

Hand Finishing

1-Install inserts & wearplates & gaskets using a drop of Sikaflex on insert holes before installing wearplates

A/R ☐ ☐ ☐ Sikaflex-291 ☐ M116945

Sikaflex expire date: 12/07

2-Coat D2594-3 O' rings with Petroleum Jelly and install on D2594-1 plugs as per Dwg D2580

3-Inspect for foreign object per QSI 024

4-Install 2855 Aft Cap as per Dwg D2590 and seal Fwd Step & Aft Cap with Sikaflex. Clean excess adhesive

A/R ☐ ☐ ☐ Sikaflex-291 ☐ M116945

Sikaflex expire date: 12/07

5-Wing Walk as per Dwg D2590 and QSI 005

4.4

Batch: M117315

1 ϕ M 11/03/13

W/O:		WORK ORDER CHANGES					
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Tuesday, April 26, 2011 2:30:41 PM



Page 8

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Revision ID:

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Item Name: Replacement Skidtube

Start Date: 4/27/2011 Start Qty: 1.00



Cust Item ID:

Required Date: 5/10/2011 Req'd Qty: 1.00



Customer:

Reference:

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start



QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop



Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
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210

QC5- Inspect part completeness to step on W/O

0.00

S 1105116



QC

Memo

0.00

(H)

Quality Control

215

Identify as per dwg & Stock Location: _____ 0.00



Packaging

Memo

0.00

PM 68978

11/05/18

Packaging

220

QC21- Final Inspection - Work Order Release 0.00



QC

Memo

0.00

11/5/18

Quality Control

11-05-18
G

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Tuesday, April 26, 2011 2:30:35 PM

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Required Qty: 1.00

[illegible][illegible]

Abstract—The purpose of this study was to determine if there were differences in the prevalence of musculoskeletal disorders among different types of workers. The study included 600 male employees from three companies who had been employed by their respective companies for at least one year. Data were collected through self-administered questionnaires. The results showed that the prevalence of musculoskeletal disorders was higher among workers in the manufacturing sector than among those in the service sector. The most common disorder was low back pain, followed by neck pain and shoulder pain. The study also found that the prevalence of musculoskeletal disorders increased with age and duration of employment.

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DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

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Picklist Print

*Tuesday, April 26, 2011 2:30:35 PM

Work Order ID: 68975

Parent Item: D204-635-041

Parent Item Name: Replacement Skidtube

Start Date: 4/27/2011

Required Date: 5/10/2011

Start Qty: 1.00

Required Qty: 1.00

AN960C10L NAS1149C0332 Purchased No

180 Each 0.0000 44 44



washer

M117291



(x44) Jd 4/27/12

AN960JD10L NAS1149D0332J Purchased No

180 Each 0.0000 2 2



Washer

M117291



(x2) Jd 4/27/12

D2594-1 Manufactured No

180 Each 403.0000 10 10



Plug, 205 Skidtube



Jd 4/27/12

Location

Loc Qty

Loc Code

FP-A

403

42807

28

66122

148

66932

220

67441

7

x10

D2594-3 Manufactured No

180 Each 1,304.000 10 10



O-Ring, 205 Skidtube



Jd 4/27/12

Location

Loc Qty

Loc Code

FP-A

1304

65518

304

66952

1000

x10

D2855 Manufactured No

180 Each 70.0000 1 1



Cap



Jd 4/27/12

Location

Loc Qty

Loc Code

FP007

70

53791

33

65519

2

65569

35

x1

W/O:		WORK ORDER CHANGES					
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Tuesday, April 26, 2011 2:30:35 PM

Page 3

Work Order ID: 68975

Parent Item: D204-635-041



Parent Item Name: Replacement Skidtube

Start Date: 4/27/2011

Required Date: 5/10/2011

Start Qty: 1.00

Required Qty: 1.00

D3564-11 Manufactured No 180 Each 2.0000 1 1
  Sl 11/05/12
Wearshoe

Location

Loc Qty

Loc Code

FP019



2

1368350

X1

66154

2

D3564-13 Manufactured No 180 Each 38.0000 1 1
  Sl 11/05/12
Wearshoe

Location

Loc Qty

Loc Code

FP017

38

66136

16



X1

66549

6

66805

16

D3564-7 Manufactured No 180 Each 15.0000 1 1
  Sl 11/05/12
Wearshoe

Location

Loc Qty

Loc Code

FP019

15



X1

33803

4

43229

11

D3564-9 Manufactured No 180 Each 3.0000 1 1
  Sl 11/05/12
Wearshoe

Location

Loc Qty

Loc Code

FP019

3

1368349

X1

67590

3

Tuesday, April 26, 2011 2:30:36 PM

Shop Packet Print

Page 3

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Parent Item Name: Replacement Skidtube

Start Date: 4/27/2011

Required Date: 5/10/2011

Start Qty: 1.00

Required Qty: 1.00

D3566-1 Manufactured No

180 Each

73.0000

2

2



Gasket



22 110512

Location

Loc Qty

Loc Code

FP015

73

68344

34

68924

39

x2

D3566-13 Manufactured No

180 Each

41.0000

1

1



Gasket



22 110512

Location

Loc Qty

Loc Code

FP014

41

66550

21

68341

20

x1

D3566-7 Manufactured No

180 Each

24.0000

1

1



Gasket



22 110512

Location

Loc Qty

Loc Code

FP015

24

37354

4

55490

20

x1

D2579 Manufactured No

150 Each

443.0000

17

17



Spacer



868737 * 17

Location

Loc Qty

Loc Code

LG002

443

66929

106

67129

196

67308

1

67430

140

W/O:		WORK ORDER CHANGES					
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

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Start Date: 4/27/2011

Required Date: 5/10/2011

Start Qty: 1.00

Required Qty: 1.00

D2500-1-190

Manufactured No

110

Each

67.0000

1

1



Ext'n -1' Beam Tube 4"

Location

Loc Qty

Loc Code

HALL

23

58427

23

LG

44

66296

44

D2597

Manufactured No

110

Each

0.0000

1



204 Web

D2576-3

Manufactured No

150

Each

9.0000

1



Step (maching detail)

Location

Loc Qty

Loc Code

LG

9

52215

9

BB 11/05/09

BB 11/05/09

BB 11/05/09

Tuesday, April 26, 2011 2:30:36 PM

Shop Packet Print

Page 5

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DART

DESIGN #	DRAWN BY PH	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED #	APPROVED #	DRAWING NO. D2590	REV. D SHEET 1 OF 2
DATE 07.04.05		TITLE 204 SKIDTUBE ASSEMBLY	SCALE NTS
A	96.09.16	NEW ISSUE	
B	96.12.02	AS MANUFACTURED	
C	98.08.28	REDRAWN, INCLUDED DEO 9094/9097	
D	07.04.05	CHANGE TO SS WEARPLATES AND GASKETS, INCLUDE DEO 9124	

RELEASED
07-06-28-#**DEO ATTACHED**

QTY -041	Part Number	Description
X	D2590-041	SKIDTUBE ASSEMBLY
1	D2500-1-190	EXTRUSION
1	D2576-3	STEP
17	D2579	CROSS BOLT SPACER
10	D2594-1	PLUG
10	D2594-3	O-RING
1	D2597	204 WEB
1	D2855	AFT CAP
1	D3564-7	WEARSHOE
1	D3564-9	WEARSHOE
1	D3564-11	WEARSHOE
1	D3564-13	WEARSHOE
2	D3566-1	GASKET
1	D3566-7	GASKET
1	D3566-13	GASKET
44	ALS7-1032-130 or AKS7-1032-130 or AKS4-1032-130 or AELS-1032-130	INSERT
44	AN3C4A	BOLT
2	AN3-5A	BOLT
44	AN960C10L	WASHER
2	AN960JD10L	WASHER

GENERAL NOTES:

- 1) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED
- 2) ALL DIMENSIONS ARE IN INCHES
- 3) INSERT D2597 WEB TO LOCATION SHOWN OFF AFT END OF SKIDTUBE AND BOND WEB INTO OUTER TUBE WITH NON-STRUCTURAL SIKAFLEX-241 ADHESIVE PER DART QSI 015 BEFORE BENDING. ENSURE HOLES LINE-UP.
- 4) BEND AS A SMOOTH RADIUS STARTING WITH A MAXIMUM CENTERLINE RADIUS OF 60 AND ENDING WITH A MINIMUM RADIUS OF 30. A MAXIMUM REDUCTION OF 0.200 IN DIAMETER IS ALLOWABLE IN THE BENT PORTION OF THE TUBE.
- 5) USE DART DRILL TEMPLATE TD2577-204 TO LOCATE AND DRILL $\varnothing 0.297$ HOLES FOR WEARSHOE INSERTS. INSTALL ALS7-1032-130 PER SECTION D-D (44 PLACES) AFTER FINISH. INSTALL AN3C4A BOLTS AND AN960C10L WASHERS WITH SIKAFLEX-241/-291.
- 6) WELDING TO BE DONE PER DART QSI 004.
- 7) FINISH:
ACID ETCH, ALODINE PER DART QSI 005 4.1 PRIOR TO INSERTING D2596 WEB
POWDER COAT ASSEMBLY GLOSS WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
BLACK ANTI-SKID PAINT AS INDICATED PER DART QSI 005 4.4
- 8) INSERT D2594-1 PLUG CW D2594-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE) AFTER FINISH (16 PLACES).

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W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

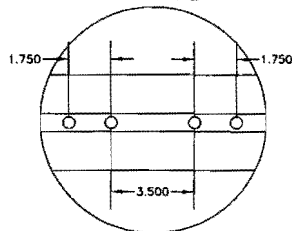
Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

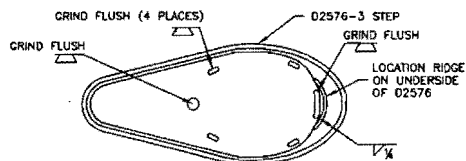
NOTE: Date & initial all entries

RELEASED
07.06.28
DEO ATTACHED

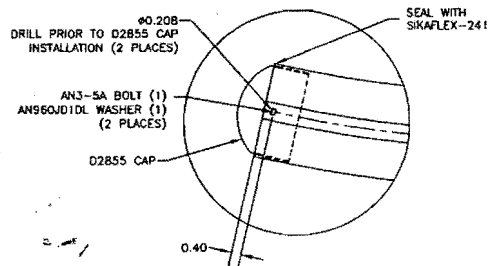
DETAIL A
SCALE 5:24



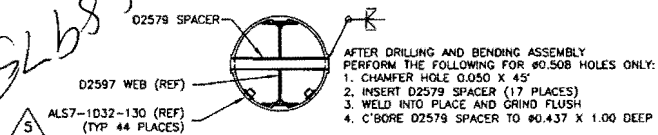
DETAIL B
SCALE 5:24



DETAIL C
SCALE 5:24

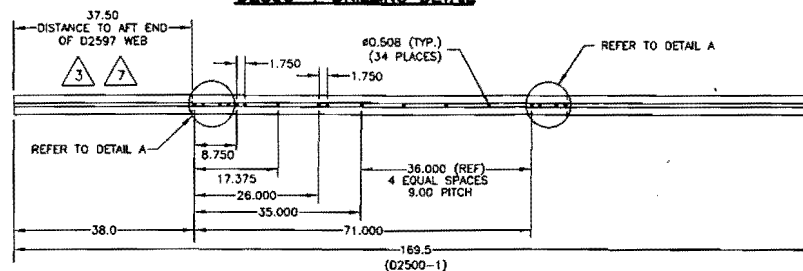


SECTION D-D
SCALE 5:24

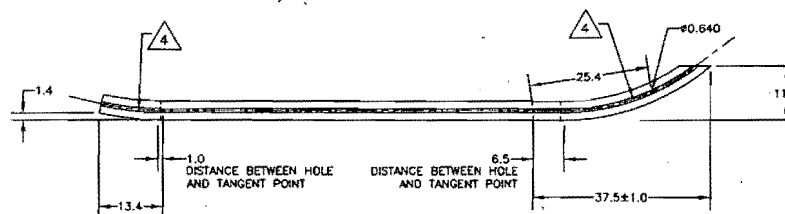


AFTER DRILLING AND BENDING ASSEMBLY PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:
1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (17 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C-BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP

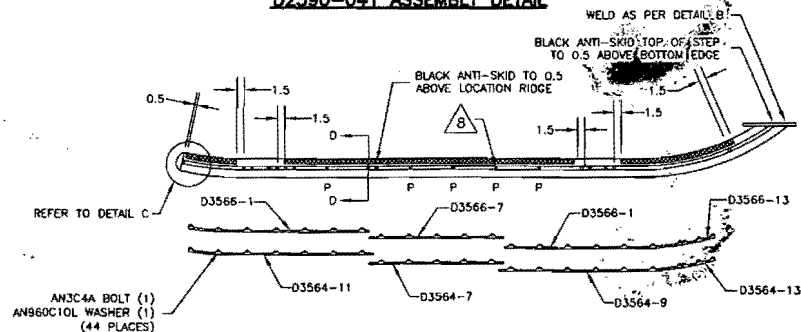
D2590-1 DRILLING DETAIL



D2590-1 BENDING AND CUTTING DETAIL



D2590-041 ASSEMBLY DETAIL



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DESIGN	DRAWN BY	DART	DART AEROSPACE LTD. HARRISBURG, ONTARIO, CANADA
CHECKED	APPROVED	DRAWING NO.	REV. D
DATE		D2590	SHEET 2 OF 2
07.04.05		TITLE	SCALE
		204 SKIDTUBE ASSEMBLY	1:24

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DRAWING NO. D2590	TITLE 204 SKIDTUBE ASSEMBLY	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D2590-D-1	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN <i>UP</i>	CHECKED <i>L</i>	MFG. APPR. <i>R</i>	APPROVED <i>WP</i>		DE APPR. <i>#</i>		
DATE 10.09.22	DATE 10.11.04	DATE 10.11.04	DATE 10/11/04		DATE 10.11.04		

PURPOSE:

CHANGE ALL WELDED CROSSBOLT SPACERS TO SWAGED SPACERS

CHANGE:

PARTS LIST IS AMENDED AS FOLLOWS:

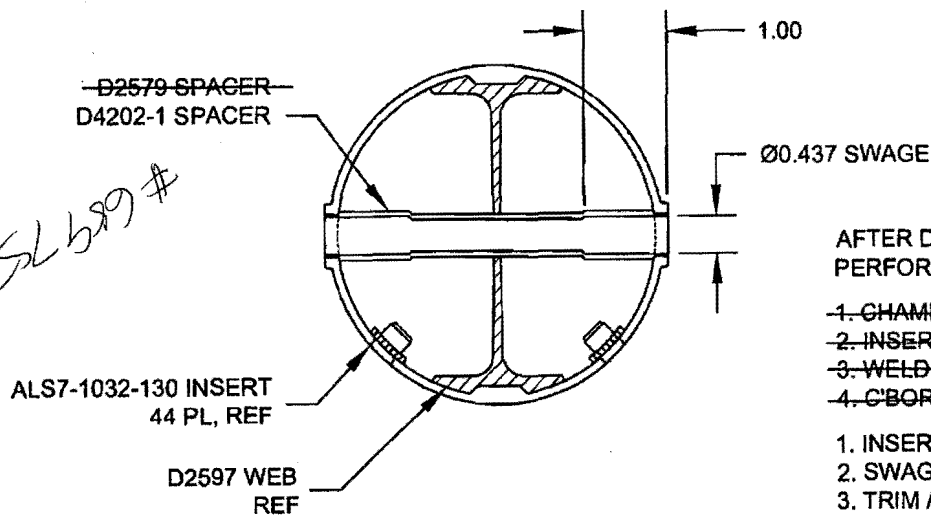
WAS

QTY	PART NUMBER	DESCRIPTION
-041		
17	D2579	CROSS BOLT SPACER

IS

17	D4202-1	SPACER
----	---------	--------

SECTION D-D IS AMENDED AS FOLLOWS:



AFTER DRILLING AND BENDING ASSEMBLY
PERFORM THE FOLLOWING FOR Ø0.508 HOLES ONLY:

1. CHAMFER HOLE 0.050 X 45°
2. INSERT D2579 SPACER (17 PLACES)
3. WELD INTO PLACE AND GRIND FLUSH
4. C'BORE D2579 SPACER TO Ø0.437 X 1.00 DEEP
5. INSERT D4202-1 SPACER, 17 PL
6. SWAGE TO Ø0.437 X 1.00 DEEP PER QSI 002
7. TRIM / GRIND FLUSH PER QSI 002

SECTION D-D
NOT TO SCALE

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RELEASED
2010-11-17
WP

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

NO. 252

AWS D17.1.2001
QUALIFICATION TEST RECORD

Name: Barclay Elliott
Job number: 66358
Part number: D206 642 541
Description: 206
Welding Process: Tig[☒] Mig[]
Base material: Aluminum
Current: AC[☒] DC[]

TEST REQUIREMENTS AND RESULTS

Visual: pass[☒] fail[]
Penetration: pass[☒] fail[]

UNACCEPTABLE

Cracks: pass[☒] fail[]
Undercut: pass[☒] fail[]
Pin holes: pass[☒] fail[]
Overlap (cold lap): pass[☒] fail[]
Porosity (surface): pass[☒] fail[]
Coloration: pass[☒] fail[]

Qualifier Pat Burns Date of Test Coupon 11-05-09
Welder Barclay Elliott Date of Test Coupon 11-05-09

The above named individual is qualified in accordance with AWS D17.1.2001 to weld

